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(71) Applicant: HYUNDAI ELECTRONICS AMERICA [US/US]; 3101 North First Street, San Jose, CA 95134 (US).

(72) Inventor: RAO, Padmanabha, R.; 1031 Sandalwood Lane, Milpitas, CA 95035 (US).

(74) Agents: STARK, Jon, R. et al.; Pennie & Edmonds LLP, 1155 Avenue of the Americas, New York, NY 10036 (US).

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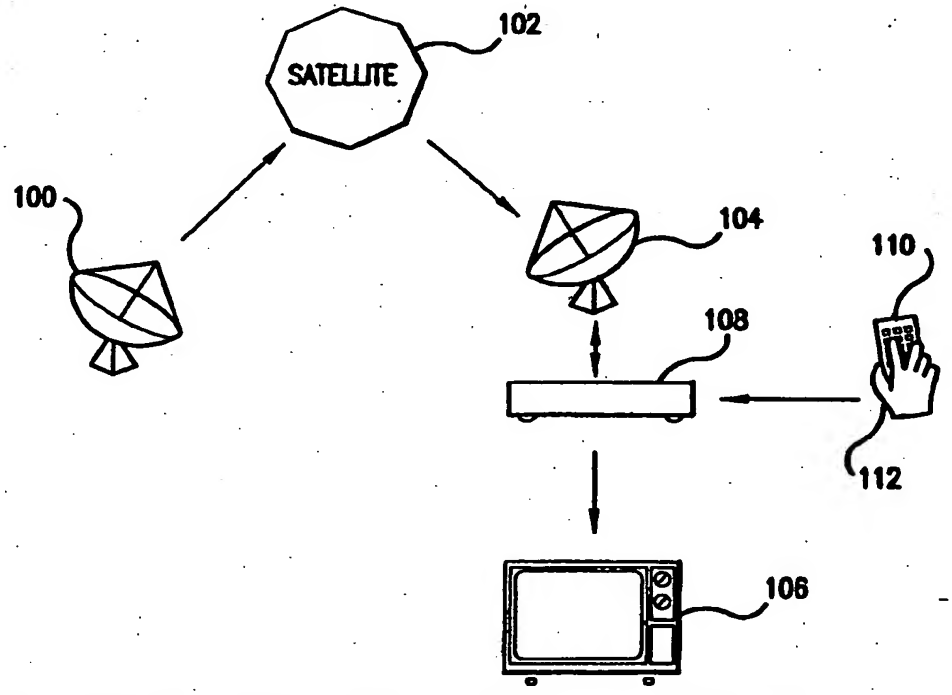
(57) Abstract

A method and apparatus are disclosed for providing data over data broadcasting systems to specially targeted audiences. In accordance with the invention, user classifications may be obtained for a plurality of data users. The classifications for a predetermined data content may also be obtained. Once the user and programming content classifications are obtained, the predetermined data content, the regular data content, and a mapping means are transmitted to multiple user reception units over separate transmission services. The mapping means indicates when the individual reception units are to switch automatically to the predetermined data content from the regular data content, and may be configured in accordance with the user classifications and the predetermined data content classifications so that each user obtains and is presented with the predetermined programming content that substantially matches that user's classifications.



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of an advertisement. However, as described herein, one aspect of the present invention is the enablement of finer granularity in mapping specialized programming content to the appropriate audience, due to the corresponding classification of viewers' preferences as well as the specialized programming content, thereby reaching the viewers with the most interest in that programming content.

In accordance with the invention, once the viewing population has been classified, and the specialized programming content likewise classified, regularly scheduled television content, such as television shows, sporting events, and movies, is separated from the specialized programming content for transmission. More particularly, the specialized programming content is transmitted to viewer satellite receivers **104** on a separate satellite transmission channel than the regularly scheduled programming content (in this context, "channel" illustratively refers to a unique digital service as defined within the Digital Video Broadcasting (DVB) standards published by the European Telecommunication Standards Institute ("ETSI")). Then, at pre-scheduled times, and as described in more detail below, selected interface units **108** can advantageously tune to the specialized programming channel to enable granular reception of specialized programming content.

This novel use of a separate specialized channel is advantageous for a variety of reasons. For example, by devoting a separate channel solely to specialized programming content, such as advertising, satellite system operator **100** can allocate a higher bandwidth to this channel to ensure higher video quality for all such specialized programming, and avoid the problems associated with the dynamic re-allocation of bandwidth whenever such material is to be aired.

Moreover, multiple interface units **108**, not all tuned to the same channel, may be simultaneously tuned to the specialized programming channel. This capability leads to obvious efficiencies in bandwidth usage, as, for example, the

accordance with the invention. As shown in FIG. 2, advertising channel 200 delivers advertisements that have been categorized according to language. Regularly scheduled television programming is also delivered over multiple channels, illustratively grouped according to language. Spanish language channels S1 through S5 (collectively the Spanish language channels 202) carry programming in the Spanish language, while English language channels E1 through E7 (collectively the English language channels 204) deliver programming in the English language. Note, however, that these channels do not have to be sequentially numbered, nor do they have to be physically co-located in the network. Grouping, for the purpose of carrying out the novel system and method disclosed herein, may instead be abstracted to a higher layer.

At a first pre-scheduled time 210, the interface units for viewers tuned to Spanish channels 202 automatically tune to advertising channel 200. The collective tuning of all interface units tuned to Spanish channels 202 to advertising channel 200 is depicted in FIG. 2 by arrow 206. At a second pre-scheduled time 212, the same interface units automatically tune back to the respective channel of Spanish channels 202 that had been tuned to before first pre-scheduled time 210, and resume decoding of the interrupted programming. This collective tuning of the interface units back to the appropriate Spanish channels of Spanish channels 202 is depicted in FIG. 2 by arrow 207. At a third pre-scheduled time 214, the interface units for viewers tuned to English channels 204 automatically tune to advertising channel 200. The collective tuning of all interface units tuned to English channels 204 to advertising channel 200 is depicted in FIG. 2 by arrow 208. At a fourth pre-scheduled time 216, the same interface units automatically tune back to the respective channel of English channels 204 that had been tuned to before third pre-scheduled time 214. This collective tuning of the interface units back to the appropriate English channels of English channels 204 is

depicted in FIG. 2 by arrow 209. During the time intervals from 210 to 212 and 214 to 216, opportunistic data may be provided over the unused bandwidth, depicted by dashed lines in FIG. 2, of Spanish channels 202 and English channels 204, respectively.

As mentioned, the tuning described herein is preferably performed internally by the interface units. The viewers need not change channels, nor do the viewers even know the channel changes are occurring. As far as the viewers are concerned, both the regularly scheduled programming content and the specialized programming content is being aired in their language of choice on the channel to which they have personally tuned.

Once a television viewer instructs interface unit 108, illustratively by remote control 110, to tune to a different programming channel, the interface unit will first automatically determine, via the mapping table described herein, whether that channel is broadcasting a regularly scheduled television event or has instead been mapped out to an specialized programming channel. Based upon this determination, interface unit 108 will tune to the appropriate channel. If indeed, the new channel is mapped to a specialized programming channel at that particular time, interface unit 108 will determine the parameters of the regular channel so that it can tune back to that channel at the end of the specialized programming break.

For proper tuning in accordance with the invention, each interface unit should always be aware of the wall clock or real time, such as the local time or Greenwich Mean Time. However, one skilled in the art will recognize that this is easily implemented using the DVB-defined Time and Date Tables (TDT) which carry snapshots of Universal time. Under the current DVB standards, these snapshots are transmitted to interface units at least once every 30 seconds and allow interface units to determine and maintain their correct local time from the universal time clock. Of course, one skilled in the art will also understand that other methods of

allowing the interface units to identify the proper time at which to tune to the advertisement channels, such as electronic prompts from system operator **100**, may be utilized.

The Mapping Tables

In accordance with the invention, system operator **100** will broadcast mapping tables to each viewer interface unit **108** via satellite **102**. These mapping tables map specialized data content to be transmitted on particular channels to particular viewers, based on viewer and advertisement classifications. In one illustrative embodiment, these mapping tables comprise advertisement mapping tables that indicate to appropriate viewer interface units **108** to automatically tune to the appropriate advertisement channels at pre-scheduled times. The tables are received and stored by interface units **108** preferably in non-volatile memory, and should span an appreciable length of time, illustratively several hours, to reduce the number of times said tables need be transmitted. However, the tables must be transmitted with sufficient regularity to quickly provide the necessary information to interface units that become operational in between advertisement map table transmissions.

In accordance with this illustrative embodiment of the invention, the information in the advertisement mapping tables may first be sorted by viewer preference categories (e.g., age or programming category). Within each viewer preference category, information may sorted by, for example, language preference (e.g., Spanish or English). Within each language preference, information may be sorted by channel. For each channel, the advertisement map table will contain several hours of advertisement information consisting of an identification of each advertisement, the time it will be transmitted, the advertisement channel it will be transmitted on, and the duration of the advertisement. One skilled in the art will recognize that such advertisement mapping tables are not defined in current DVB standards, but that they can be easily constructed using current DVB syntax.

One skilled in the art will also recognize that the mapping tables need not be configured in accordance with user classifications. Thus, in another illustrative embodiment of the invention, user classifications are not obtained for the plurality of users before broadcast of the specialized data content, such as advertising, and the regular data content, such as regularly scheduled programming, over separate broadcasting services. In this embodiment of the invention, the mapping tables are configured only in accordance with the specialized data content classifications. Thus, for example, the mapping tables would indicate that if an advertisement is classified and thus scheduled for prime time television in San Jose, California, all interface units in San Jose, California, regardless of particular viewer preferences, would be instructed by the mapping tables to tune to the appropriate advertising channel at the appropriate time.

In yet another illustrative embodiment of the invention, neither user classifications nor specialized content classifications are obtained prior to broadcast of the specialized data content and the regular data content over separate broadcasting services. In this embodiment of the invention, the mapping tables are configured by the system operator in accordance with other criteria, including for example, the demands of the creator of the specialized data content or the availability of time slots for transmitting specialized data content. Thus, for example, if the system operator has specialized data content that is to be transmitted over particular channels, and the system operator has particular time slots available for such transmissions, the system operator can configure the mapping tables to instruct certain interface units to switch to the specialized data content at the available times.

FIG. 3 provides an exemplary embodiment of an advertisement map table constructed using primarily DVB syntax. As shown in FIG. 3, the advertisement map table is comprised of a number of fields, each of which is a certain number of bits in length. The number of bits for each field

shown in FIG. 3 is merely illustrative, and one skilled in the art will understand that the number of bits for each particular field may be varied.

While several fields of the advertisement map table shown in FIG. 3 are not currently part of the DVB standard, several of the fields are currently part of the DVB standard and may be used to construct the advertisement map table. Moreover, one skilled in the art will understand that those fields that are not currently part of the DVB standard are similar to and derived from current DVB defined fields. What follows is a listing and description of some of the fields in the advertisement map table according to the invention. Use of fields disclosed in FIG. 3, but not listed below, is well known in the art and need not be further described herein.

table_id: Specific values assigned within the DVB standard cannot be used. Therefore, only "user-defined" values under the DVB standards may be used.

advertisement_preference_id: Identifies the advertisement preference(s) for each interface unit. A unique value is utilized to indicate no preference.

ISO_659_language_code: Identifies the language of the advertisement content.

service_id: Differentiates the service for which the advertisement map is being defined from any other services within a transport stream.

transport_stream_id: differentiates the service for which the advertisement map is being defined from any other multiplex in the delivery system;

original_network_id: Identifies the network_id of the originating delivery system of the transport stream.

The following described fields of the advertisement map table in FIG. 3 are not part of the present DVB standard, but may be easily implemented using the same:

ad_event_id: Identifies the advertisement event, which will be unique for a given ad_service_id (see below).

ad_start_time: Start time of the ad_event in Universal Time, Co-ordinated ("UTC"), and Modified Julian Date ("MJD"), each of which is described in the DVB standard.

ad_duration: Duration of the ad_event in hours, minutes, and seconds as described in the EIT section of the DVB standard.

ad_service_id: Differentiates the advertisement service from any other service within the transport stream that carries the advertisement content.

ad_transport_id: Differentiates the advertisement transport_stream, about which the advertisement table provides information, from other multiplex in the delivery system.

ad_original_network_id: Identifies the network_id of the originating delivery system carrying the advertisement service.

Every interface unit receives the above-described advertisement map table, but may be configured to store only the part of the table that corresponds to its stored advertisement preference categories and language preferences. For interface units that do not have viewer-chosen preferences, default preferences may be applied. Thus, for example, an interface unit that has the Italian language set as its preference, need not store the portions of the advertisement map table that does not describe the advertisement mapping for the Italian language.

As described herein, once the advertisement map table is made available to the interface units, the interface units will have the ability to automatically keep track of the times at which the DVB service channel parameters should be changed to automatically present advertisements from the advertisement channel to the viewer, and when the parameters should be restored to their original values.

Various embodiments of the invention have been described. The descriptions are offered by way of illustration, not limitation. Thus, as explained herein, it will be apparent to those skilled in the art that modifications may be made to the invention as described without departing from the scope of the claims set out below.

What is claimed is:

1. A method for providing data to a plurality of users with user reception units over a data broadcasting system, comprising the steps of:

obtaining user classifications for said plurality of users, said user classifications based on a first predetermined set of criteria indicative of the preferences of said users;

obtaining content classifications for a predetermined data content, said content classifications based on a second predetermined set of criteria indicative of the preferences of said users to which said predetermined data content is directed;

broadcasting said predetermined data content to said plurality of user reception units by a first broadcasting service, said user reception units configured to receive data and present data to said users;

broadcasting regular data content to said plurality of user reception units by a second broadcasting service; and

broadcasting a means to said plurality of user reception units for indicating when said user reception units are to automatically switch from the presentation of said regular data content to the presentation of said predetermined data content, said means configured in accordance with said user classifications and said content classifications.

2. The method of claim 1, wherein said data broadcasting system comprises a satellite broadcasting system.

3. The method of claim 1, wherein said data broadcasting system comprises a computer network.

4. The method of claim 1, wherein said user reception unit comprises a television set-top unit.

5. The method of claim 4, wherein said first and second transmission services comprise television channels.

6. The method of claim 5, wherein said predetermined data content comprises television advertising and said regular data content comprises regularly scheduled television programming.

7. The method of claim 1, wherein said user reception unit comprises a personal computer.

8. The method of claim 1, wherein said means for indicating when said reception units are to automatically switch presentations comprises a mapping means, and wherein said mapping means further indicates when said reception units are to automatically switch back to the presentation of regular data content from the presentation of said predetermined data content.

9. The method of claim 8, wherein said mapping means indicates to a first subset of said user reception units to automatically switch from the presentation of said regular data content to the presentation of said predetermined data content at a first predetermined time, and indicates to a second subset of said user reception units to automatically switch from the presentation of said regular data content to the presentation of said predetermined data content at a second predetermined time.

10. The method of claim 1, further comprising the step of broadcasting opportunistic data over said second transmission service when said user reception units are presenting said predetermined data content.

11. The method of claim 1, wherein said first predetermined set of criteria includes user age and preferred language.

12. The method of claim 1, wherein said second predetermined set of criteria includes age of desired user and regular data content type with which said predetermined data content is to be temporally matched.

13. The method of claim 1, wherein said first predetermined set of criteria is substantially the same as said second predetermined set of criteria.

14. A system for providing data to a plurality of users with user reception units over a data broadcasting system, comprising:

means for obtaining user classifications for said plurality of users, said user classifications based on a first predetermined set of criteria indicative of the preferences of said users;

means for obtaining content classifications for a predetermined data content, said content classifications based on a second predetermined set of criteria indicative of the preferences of said users to which said predetermined data content is directed;

means for broadcasting said predetermined data content to said plurality of user reception units by a first broadcasting service, said user reception units configured to receive data and present data to said users;

means for broadcasting regular data content to said plurality of user reception units by a second broadcasting service; and

means for broadcasting a means to said plurality of user reception units for indicating when said user reception units are to automatically switch from the presentation of said regular data content to the presentation of said predetermined data content, said means configured in accordance with said user classifications and said content classifications.

15. The system of claim 14, wherein said data broadcasting system comprises a satellite broadcasting system.

16. The system of claim 14, wherein said data broadcasting system comprises a computer network.

17. The system of claim 14, wherein said user reception unit comprises a television set-top unit.

18. The system of claim 17, wherein said predetermined data content comprises television advertising and said regular data content comprises regularly scheduled television programming.

19. The system of claim 14, wherein said user reception unit comprises a personal computer.

20. The system of claim 14, wherein said means for indicating when said reception units are to automatically switch presentations comprises a mapping means, and wherein said mapping means further indicates when said reception units are to automatically switch back to the presentation of regular data content from the presentation of said predetermined data content.

21. The system of claim 20, wherein said mapping means indicates to a first subset of said user reception units to automatically switch from the presentation of said regular data content to the presentation of said predetermined data content at a first predetermined time, and indicates to a second subset of said user reception units to automatically switch from the presentation of said regular data content to the presentation of said predetermined data content at a second predetermined time.

22. The system of claim 14, further comprising a means for broadcasting opportunistic data over said second transmission

service when said user reception units are presenting said predetermined data content.

23. The system of claim 14, wherein said first predetermined set of criteria includes user age and geographic location.

24. The system of claim 14, wherein said second predetermined set of criteria includes age of desired user and regular data content type with which said predetermined data content is to be temporally matched.

25. The system of claim 14, wherein said first predetermined set of criteria is substantially the same as said second predetermined set of criteria.

26. A method for providing television programming to a plurality of viewers with television set-top units over a satellite broadcasting system, comprising the steps of:

obtaining viewer classifications for said plurality of television viewers, said classifications based on a first predetermined set of criteria indicative of the preferences of said viewers;

obtaining content classifications for a predetermined programming content, said classifications based on a second predetermined set of criteria indicative of the preferences of said viewers to which said predetermined programming content is directed;

broadcasting said predetermined programming content to said plurality of television viewer set-top units by a first satellite transmission service;

broadcasting regularly scheduled programming television content to said plurality of viewer set-top units by a second satellite transmission service; and

broadcasting a mapping means to said plurality of viewer set-top units for indicating when said set-top units are to automatically tune to said predetermined programming content from said regularly scheduled programming television content

and when said set-top units are to automatically tune back to said regularly scheduled programming television content from said predetermined programming content, said mapping means configured in accordance with said viewer classifications and said content classifications.

27. The method of claim 26, wherein said predetermined programming content comprises television advertising.

28. The method of claim 26, further comprising the step of broadcasting opportunistic data over said second transmission service when said set-top units are tuned to said predetermined programming content.

29. The method of claim 26, wherein said first predetermined set of criteria is substantially the same as said second predetermined set of criteria.

30. An apparatus for providing television programming to a plurality of viewers with television set-top units over a satellite broadcasting system, comprising:

means for obtaining viewer classifications for said plurality of television viewers, said classifications based on a first predetermined set of criteria indicative of the preferences of said viewers;

means for obtaining content classifications for a predetermined programming content, said classifications based on a second predetermined set of criteria indicative of the preferences of said viewers to which said predetermined programming content is directed;

means for broadcasting said predetermined programming content to said plurality of television viewer set-top units by a first satellite transmission service;

means for broadcasting regularly scheduled programming television content to said plurality of viewer set-top units by a second satellite transmission service; and

means for broadcasting a mapping means to said plurality of viewer set-top units for indicating when said set-top units are to automatically tune to said predetermined programming content from said regularly scheduled programming television content and when said set-top units are to automatically tune back to said regularly scheduled programming television content from said predetermined programming content, said mapping means configured in accordance with said viewer classifications and said content classifications.

31. The apparatus of claim 30, wherein said predetermined programming content comprises television advertising.

32. The apparatus of claim 30, further comprising a means for broadcasting opportunistic data over said second transmission service when said set-top units are tuned to said predetermined programming content.

33. The apparatus of claim 30, wherein said first predetermined set of criteria is substantially the same as said second predetermined set of criteria.

34. A method for providing data to a plurality of users with user reception units over a data broadcasting system, comprising the steps of:

obtaining content classifications for a predetermined data content, said content classifications based on a predetermined set of criteria indicative of the preferences of said users to which said predetermined data content is directed;

broadcasting said predetermined data content to said plurality of user reception units by a first broadcasting service, said user reception units configured to receive data and present data to said users;

broadcasting regular data content to said plurality of user reception units by a second broadcasting service; and

broadcasting a means to said plurality of user reception units for indicating when said user reception units are to automatically switch from the presentation of said regular data content to the presentation of said predetermined data content and when said user reception units are to automatically switch back to said regular data content from said predetermined data content, said means configured in accordance with said content classifications.

35. The method of claim 34, further comprising the step of broadcasting opportunistic data over said second broadcasting service when said reception units are switched to said predetermined data content.

36. The method of claim 34, wherein said data broadcasting system comprises a satellite broadcasting system.

37. The method of claim 34, wherein said user reception unit comprises a television set-top unit.

38. The method of claim 34, wherein said predetermined data content comprises television advertising and said regular data content comprises regularly scheduled television programming.

39. The method of claim 34, wherein said indicating means indicates to a first subset of said user reception units to automatically switch from the presentation of said regular data content to the presentation of said predetermined data content at a first predetermined time, and indicates to a second subset of said user reception units to automatically switch from the presentation of said regular data content to the presentation of said predetermined data content at a second predetermined time.

40. A method for providing specialized data to a plurality of users with user reception units over a data broadcasting system, comprising the steps of:

broadcasting a predetermined data content to said plurality of user reception units by a first broadcasting service, said user reception units configured to receive data and present data to said users;

broadcasting regular data content to said plurality of user reception units by a plurality of broadcasting services, said plurality of broadcasting services being separate and distinct from said first broadcasting service; and

broadcasting a means to said plurality of user reception units for indicating when said user reception units are to automatically switch from the presentation of said regular data content from said plurality of broadcasting services, to the presentation of said predetermined data content from said first broadcasting service, and when said user reception units are to automatically switch back to the presentation of said regular data content from said plurality of broadcasting services from said predetermined data content.

41. The method of claim 40, further comprising the step of broadcasting opportunistic data over said plurality of broadcasting services when said reception units are switched to said predetermined data content.

42. The method of claim 40, wherein said data broadcasting system comprises a satellite broadcasting system.

43. The method of claim 40, wherein said predetermined data content comprises television advertising and said regular data content comprises regularly scheduled television programming.

44. The method of claim 40, wherein said indicating means indicates to a first subset of said user reception units to automatically switch from the presentation of said regular data content to the presentation of said predetermined data content at a first predetermined time, and indicates to a second subset of said user reception units to automatically switch from the presentation of said regular data content to the presentation of said predetermined data content at a second predetermined time.

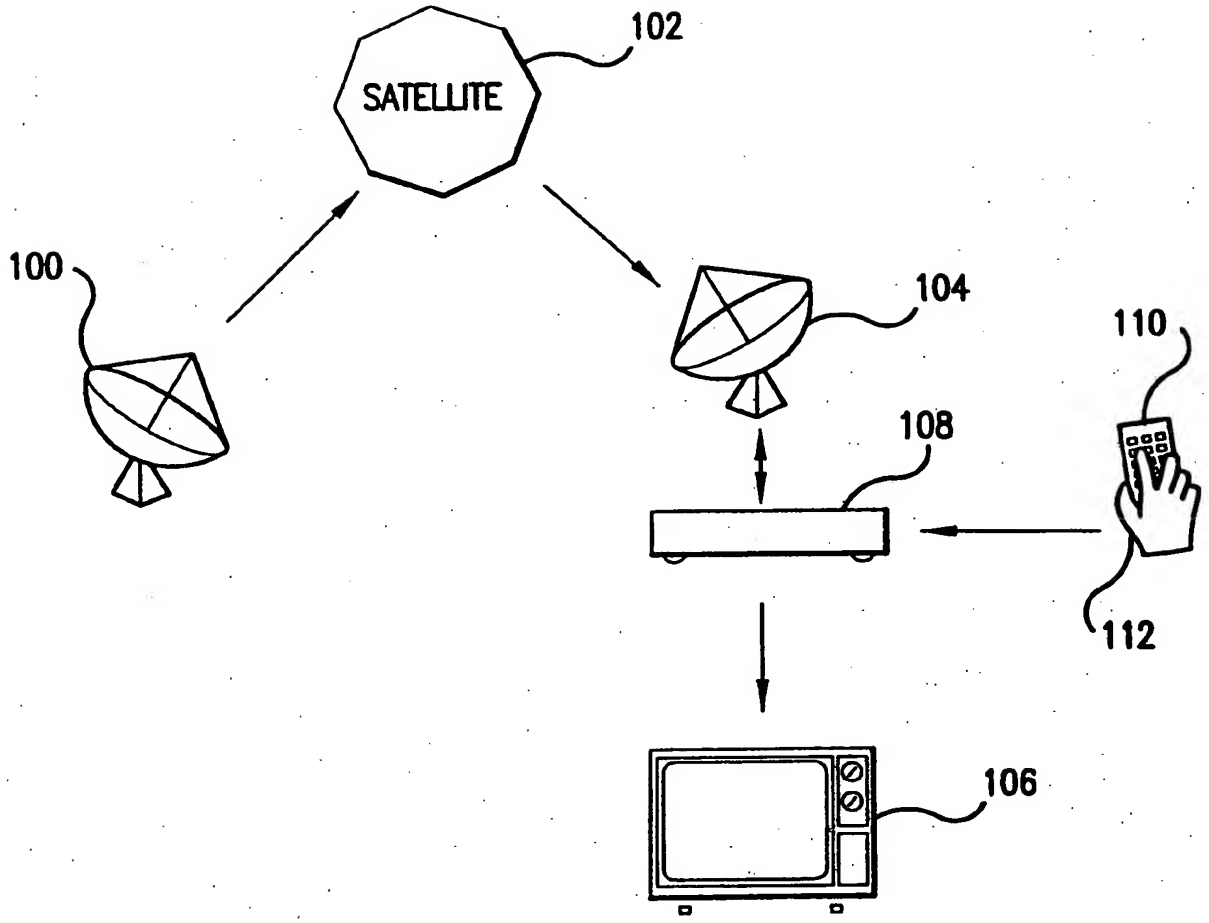

FIG.1

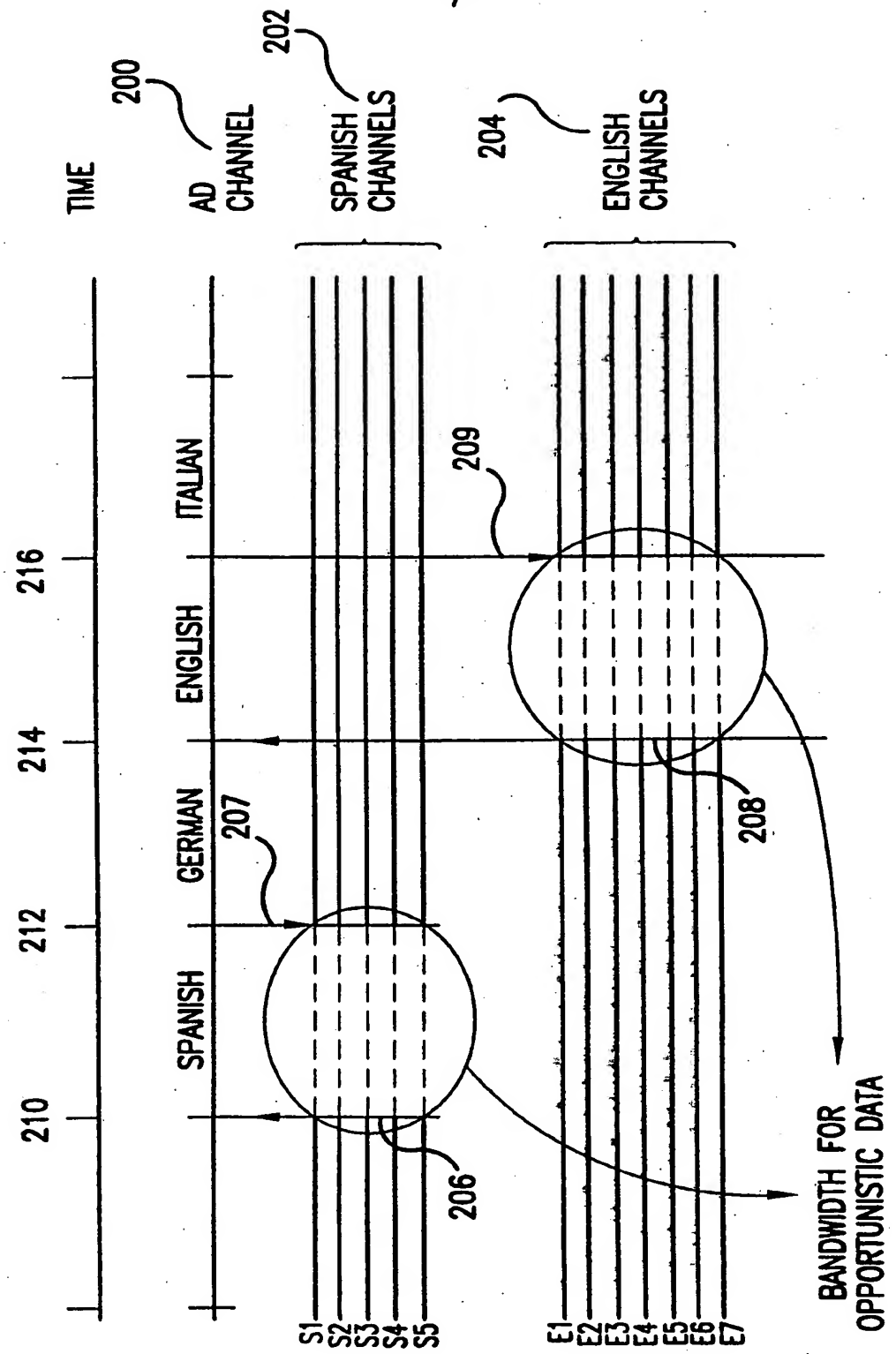
TIME
200
AD CHANNEL
202
SPANISH CHANNELS
204
ENGLISH CHANNELS
216
214
212
210
ITALIAN
ENGLISH
GERMAN
SPANISH
209
207
208
206
S1
S2
S3
S4
S5
E1
E2
E3
E4
E5
E6
E7
BANDWIDTH FOR OPPORTUNISTIC DATA

FIG.2

SYNTAX	BITS
ADVERTISEMENT_MAP_SECTION {	
TABLE_ID	8
SECTION_SYNTAX_INDICATOR	1
RESERVED_FUTURE_USE	1
RESERVED	2
SECTION_LENGTH	12
ADVERTISEMENT_PREFERENCE_ID	16
RESERVED	2
VERSION_NUMBER	5
CURRENT_NEXT_INDICATOR	1
SECTION_NUMBER	8
LAST_SECTION_NUMBER	8
ISO_659_LANGUAGE_CODE	24
SERVICE_ID	16
TRANSPORT_STREAM_ID	16
ORIGINAL_NETWORK_ID	16
FOR (I=0; I<N; I++) {	
AD_EVENT_ID	16
AD_START_TIME	40
AD_DURATION	24
AD_SERVICE_ID	16
AD_TRANSPORT_STREAM_ID	16
AD_ORIGINAL_NETWORK_ID	16
}	
CRC_32	32
}	

FIG.3

PN : EP 947098 A2 991006
AN : EP 97954584 971219
PR : US 770936 961220
NO : WO 9828869
DS : AT BE CH DE DK ES FI FR GB GR IE IT LI LU NL PT SE
MC : H04N- 07/10
ET : SYSTEM AND METHOD FOR DELIVERING DATA OVER A DATA BROADCASTING SYSTEM TO SPECIALLY TARGETED AUDIENCES
FT : SYSTEME ET PROCEDE DE COMMUNICATION DE DONNEES PAR UN SYSTEME DE RADIODIFFUSION DE DONNEES QUI ENVOIE LES DONNEES A DES PUBLICS SPECIFIQUEMENT CIBLES
GT : VORRICHTUNG UND VERFAHREN ZUR DATENKOMMUNIKATION ÜBER EIN DATENRUNDFUNKSYSTEM AN SPEZIELL AUSGEWÄHLTE ZUSCHAUER
PA : HYUNDAI ELECTRONICS AMERICA
IN : RAO, Padmanabha, R.